**Computer Design**

(a) For a MIPS-32 processor executing a jump to subroutine, how are state and control passed between the function and the caller? Indicate what state is passed, but details of particular register numbers are not required. [5 marks]

(b) On the MIPS-32 processor the flow of control can be changed using branch or jump instructions, or by three other mechanisms. What are the three other mechanisms for changing the flow of control and what are they used for? [6 marks]

(c) What is a *control hazard* and what hardware and software techniques can be used to resolve control hazards? [5 marks]

(d) Some instruction sets make all instructions conditional (e.g. the ARM) or have conditional move instructions (e.g. IA32). How can these conditional instructions be used to avoid control hazards? [4 marks]